

REMARKS FOR ADMINISTRATOR BOLDEN
U.S. INDIA CIVIL SPACE JOINT WORKING GROUP

March 21, 2013

It's my pleasure to be here this morning for the fourth U.S.-India Civil Space Joint Working Group meeting. I am pleased to welcome my colleagues from the Indian Space Research Organization (ISRO) and the Ministry of Earth Science to Washington, and to greet my colleagues from NOAA and USGS. I'd like to extend my sincere thanks to the State Department for hosting today's meeting. Finally, I'd like to extend a special welcome on behalf of NASA to Ambassador Rao.

As our two countries reflected in our 2010 joint statement: "The possibility of cooperation between the two nations in space, to advance scientific knowledge and human welfare, are without boundaries or limits." I couldn't agree more.

I'm also delighted that the strong inter-governmental cooperation that NASA enjoys with other U.S. agencies demonstrates our nation's strong commitment to learning more about our planet and fuels the innovation that will drive tomorrow's breakthroughs.

When people ask me why we explore, I always tell them about the benefits to people here on Earth, from the things we have learned about our planet and its systems, to the new technologies we've developed.

But there's an aspirational aspect to our work as well. We're trying to raise the bar of human achievement just because it's the right thing to do. And we only enhance our progress when we combine our strengths with those of other nations.

Often in partnership with other nations, NASA has dozens of science missions in operation and many more in the works.

These missions are meeting national and science community priorities, leveraging robotic missions to explore the solar system, supporting space-based observatories, studying Earth, and monitoring climate change. These include the James Webb Space Telescope proceeding toward its 2018 launch; the *Aquarius* instrument studying ocean salinity; the Cassini spacecraft still orbiting Saturn after 15 years; and many more. And, of course, we must not forget the *Curiosity* rover on Mars.

We also have New Horizons set to reach Pluto in 2015 while Dawn reaches the dwarf planet Ceres that same year and Juno reaches Jupiter in 2016. The Solar Dynamic Observatory has sent us unprecedented images of the sun and helped us understand the effects of solar weather on our spacecraft and communications.

This year, we'll also launch MAVEN to study the atmosphere of Mars. We'll send a rover to Mars in 2020 that will be largely based on the Mars Science Laboratory mission architecture.

The Landsat Data Continuity Mission launched in February to continue the Landsat Program's 40-year data record of monitoring Earth's landscapes from space. NASA's partner in this mission is the U.S. Geological Survey (USGS). In addition to operating the Landsat satellites, USGS provides the largest archive of remotely sensed land data in the world, supplying continuous access to current and historical land images worldwide for free.

In August this year the Lunar Atmosphere and Dust Environment Explorer, or LADEE, will launch to orbit the moon and gather detailed information about the lunar atmosphere, conditions near the surface, and environmental influences on lunar dust. This will help us understand the moon and other planetary bodies better.

Of course, we also want to send humans to deep space destinations as well. NASA is making great progress on the *Orion* multi-purpose crew vehicle and Space Launch System.

These vehicles will undoubtedly have a great impact on the way our partners and we travel to farther destinations. *Orion* is undergoing final construction and integration in preparation for its initial test flight in 2014 to simulate re-entry from a lunar mission. The Space Launch System will launch an *Orion* spacecraft around the moon in 2017 and will launch a mission with crew around the moon in 2021.

For us to focus on those new destinations, we decided the time was right to hand over transport to low-Earth orbit to commercial partners, and I'm happy to report that regular, commercial resupply missions to the International Space Station have begun. SpaceX's *Dragon* spacecraft is berthed to the station right now on its second contracted mission, and Orbital Sciences' *Antares* rocket is scheduled for a test flight in the coming weeks.

Boeing, SpaceX and Sierra Nevada continue to work hard to develop the capability to once again launch astronauts from American soil within five years.

We'll need a lot of new technologies to take us farther, from radiation protection to in-space propulsion, among many others. New technologies and new capabilities cut across all NASA missions, from human space exploration, to science and aeronautics.

Our new Space Technology Program currently involves more than 800 projects that are developing these new technologies and sparking the innovation we need for tomorrow's missions and tomorrow's technology-driven economy.

We should also never forget that the first "A" in NASA stands for Aeronautics. Our aeronautics program is collaborating with other government agencies and private sector partners to advance the state of the art in aviation, with the goal of helping to make air travel across the world safer, quieter, cleaner, and more efficient.

But to get back to the reason we're here today, I think one of the biggest legacies of exploration will be how it continues to bring nations together.

Science and exploration blur borders, as we work together in awe of the world around us – eager to learn more and make new discoveries. It's a very exciting time to be involved in space exploration.

In addition to all the science and research on human health that has been and continues to be conducted on the International Space Station (ISS), perhaps its most profound historic achievement is how it continues to demonstrate that many nations can work together on a project of enormous scope, complete its construction, and then keeps it going.

Fifteen nations contributed to the development and assembly of the station and even more are or will soon become involved in the program through their utilization of this amazing research facility on-orbit.

The ISS represents our toehold to the rest of the solar system. What we learn there is going to make it possible for us to venture farther into the solar system – to an asteroid and Mars.

And now that its construction is completed, we expect many more partnerships in the future with academia, industry, other U.S. agencies, and other countries, to help bring it to its full potential and fully utilize this incredible investment.

The International Space Station may be one of the most prominent examples of our work with other nations. But our work on smaller, focused projects with other countries has also vastly increased what we have been able to achieve in space. Perhaps we can just put one or two instruments on a larger mission. Perhaps we can foster exchange between the best minds in our nations. But all of this work is having a cumulative effect of improving life on our planet and inspiring all our people to look to the heavens and imagine what we can do together.

So it's wonderful to see how the relationship between NASA ISRO has grown and evolved, the agreements we have signed since this group last convened, and the great promise our relationship holds for the future.

The value of bilateral cooperation was well reflected, for instance, through the inclusion of two NASA instruments on the successful Chandrayaan-1 lunar mission, which led to significant discoveries about lunar surface characteristics.

Earth observation data and information yield a broad range of societal benefits, and through cooperation between our agencies, we've embarked on a number of collaborative activities in this area.

Our active cooperation on Oceansat-2 data utilization is certain to yield deeper understanding of our world's oceans in all their complexity, and cooperation in the Global Precipitation Measurement/Megha-Tropiques mission, with the goal of better understanding tropical meteorology and climate, will also advance our knowledge.

We applaud India's success in all its space endeavors, including new activities in astrophysics, heliophysics, and other areas.

From the recent launch of the SARAL oceanographic satellite to your upcoming planned first mission to Mars, you have our very best wishes for continued success.

I know we've already been taking steps to bring together scientists and mission developers to examine capabilities and potential approaches for future collaborative missions, to look at ways we can work together in a number of areas.

The work of this group is very important and as has been noted, it is a useful mechanism to endorse proposals for enhanced cooperation, promote understanding of government policies and procedures, and facilitate collaboration by addressing issues promptly.

But beyond that, it's about people exchanging ideas – about meeting face-to-face and planning a brighter future for humanity. As the head of NASA, I know that when I sit down with my fellow leaders of space agencies across the world, what really matters in all this is the human aspect.

We may develop technologies to do amazing things, but people have to first imagine them and their impacts, design and build them, and utilize their data. We have to make them matter to people.

When I served on space shuttle crews, many with international participants, we worked together toward common goals – big, challenging goals. And that's what you're doing here at this meeting.

I commend the U.S.-India Civil Space Joint Working Group for its continued focus on the many and varied issues before it and for keeping this work alive across the years. Space exploration is always about the long haul. Our work is just too complex to be anything but a long-term process. So thank you for your diligence even when your work sometimes takes years to come to fruition. Thank you for being open to possibility; for your collegiality; your hard work; and your willingness to move us all on to new frontiers, together. I look forward with eager anticipation to the outcomes of this meeting. Thank you.

